Carol 1

Maryland Department of Natural Resources

Maryland Geological Survey
2300 St. Paul Street
Baltimore, Maryland 21218
Telephone: _____

William Donald Schaefer
Governor

Torrey C. Brown, M.D.
Secretary

Kenneth N. Weaver
Director

Emery T. Cleaves
Deputy Director

Division of Archeology
301/554-5530

Dr. Frank J. Vento
Dept. of Geography and Earth Science
Clarion State University
Clarion, PA 16214

31 October 1989

Dear Frank:

Enclosed is some preliminary data on artifact distribution at the Higgins site. I'm sure this will not enable you to correlate your data with mine at this point, but more information will be forthcoming over the next few weeks. Although I've completed my artifact attribute analyses, I'm only now at the stage where I can start to work out the vertical and horizontal cultural stratigraphy based on diagnostic artifacts.

The enclosed chart is the basis for standardizing level designations throughout the site (some units were excavated by separating out multiple levels above the plowzone). While Level 2 is usually the 1st level of intact subsoil, that is not always so. What may help you now is the designation of levels with highest artifact density. I've also included my data on artifact crossmends.

In general, what I believe about the stratigraphy is as follows. The only documented incidence of vertical stratification is in Block 1 where Late Archaic features are clearly located above Paleo remains. There is no intervening sterile zone, however. The Archaic stuff is concentrated in levels 2 and 3, while the Paleo stuff is mostly in level 4 and below. Level 4, however, contains an admixture, and the separation of components is by no means complete. I believe the original ground surface sloped in this area. The Late Archaic stuff gets deeper as one moves north. Even some of the Late Archaic features rest in Level 4 in this area.

During Phase II testing a 1 x 2 meter unit, well south of the Phase III project area, appeared to have two stratified dispersed scatters of fire-cracked rock. No diagnostic artifacts were recovered, however, and the excavated area is so small that it is risky to draw conclusions about stratigraphy.

In Block 3, the Early Woodland ceramics are in the plowzone, Level 2 (majority), and Level 3. I have 2 Kirks from this Block in Level 4, which implies some potential stratigraphy. I haven't plotted out the vertical positions of the Middle Archaic points yet (I'm placing Otter Creeks and Brewerton Side-notched points in this period). The is a probable buried stream channel at the south end of this block; the sherds and Kirks are located in the north end.

As you may have noted from my MAAC paper, I believe plowing destroyed pre-existing stratigraphy. This is based on diagnostic projectile point types in private surface collections vs. the excavated sample. I have only 1 Middle Archaic artifact from the surface, and no surface Early Archaic or Paleo artifacts. With the exception of those nasty ceramics, virtually all the Woodland stuff is from the surface or the plowzone. There are substantial Middle Archaic remains below the plowzone, along with the smaller Early Archaic and Clovis components. The stemmed points straddle the plowzone/subsoil interface.

Obviously, there is still a lot of distributional work to be done. I'll send the results to you as they become available. I hope all is going well with your work. The schedule is getting tight here, but I think it's still under control. May your kids calm down!

Sincerely,

Carol A. Ebright
Principal Investigator

CAE:ejs

Enclosures

10-6-88

Dear Frank,

I gathered the soil samples from each of the three deep excavation units as you requested. I have enclosed soil profiles drawn of the units with the sample columns marked in red. Individual samples are marked with a letter representing the natural layer, followed by a number indicating the sequence within the layer. Numbers begin again at 1 with each new layer.

Samples in general were taken every 5 cm, however, I didn't usually mix soils from different layers. (The single exception to this is in Block 2 where the interface between layers F and H was bagged together.) The bottom sample from each layer, therefore, may be smaller, as are samples from very thin layers. The thickness should be marked on the bags if the sample was less than 5 cm thick. The usual volume of samples is approximately 5 cm thick by 10 cm wide by 8 cm deep.

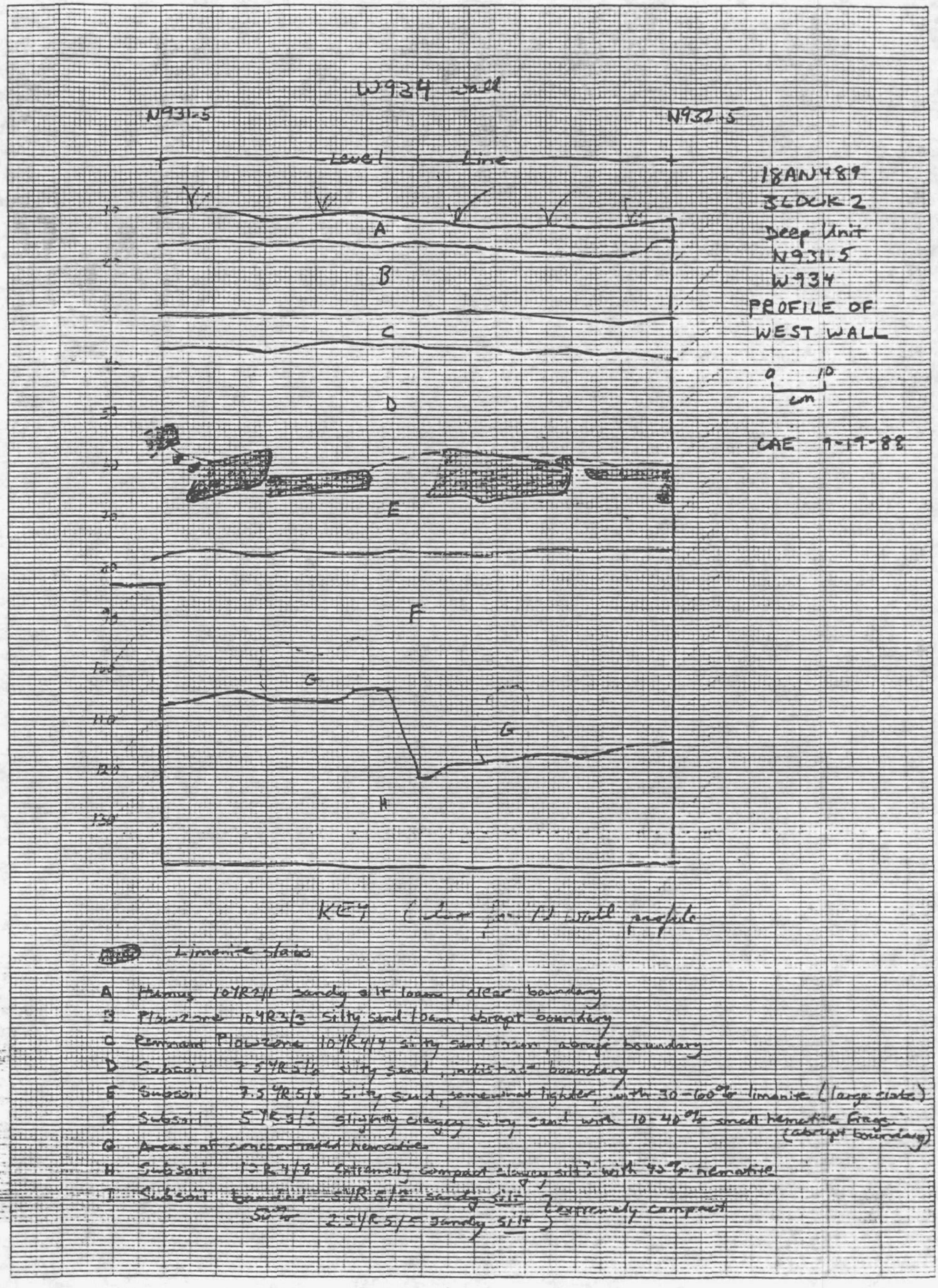
Since our Paleo-Indian finds, we are particularly interested in anything you can tell us about layers D through H in Block 1. You may also be interested to know that we uncovered what appears to be a small stream channel in the northern end of this block. It appears to bound the Paleo component to the north, and may be responsible for its burial and stratigraphic separation. Most of the Paleo stuff comes out in levels 4 through 7, but adjacent to the channel, we were finding artifacts as deep as level 10. (Our levels are arbitary 10 cm, except for the PZ which was taken off in one single level about 20 cm thick.)

We will continue our fieldwork at least through October. If you have questions about the samples, collection strategy, etc. that Ira can't answer, you can call me at home in the evening at (301) 833-6820 before 9:30. I will be looking forward to hearing from you about any preliminary results. Ken Weaver, Emory Cleaves, Jim Reger, and John Glaser returned to the site several days after you left, and substantially revised the interpretations of deposition. I hope the SEM and geochemical analyses of the soil samples can clear things up.

Sincerely,

Carol

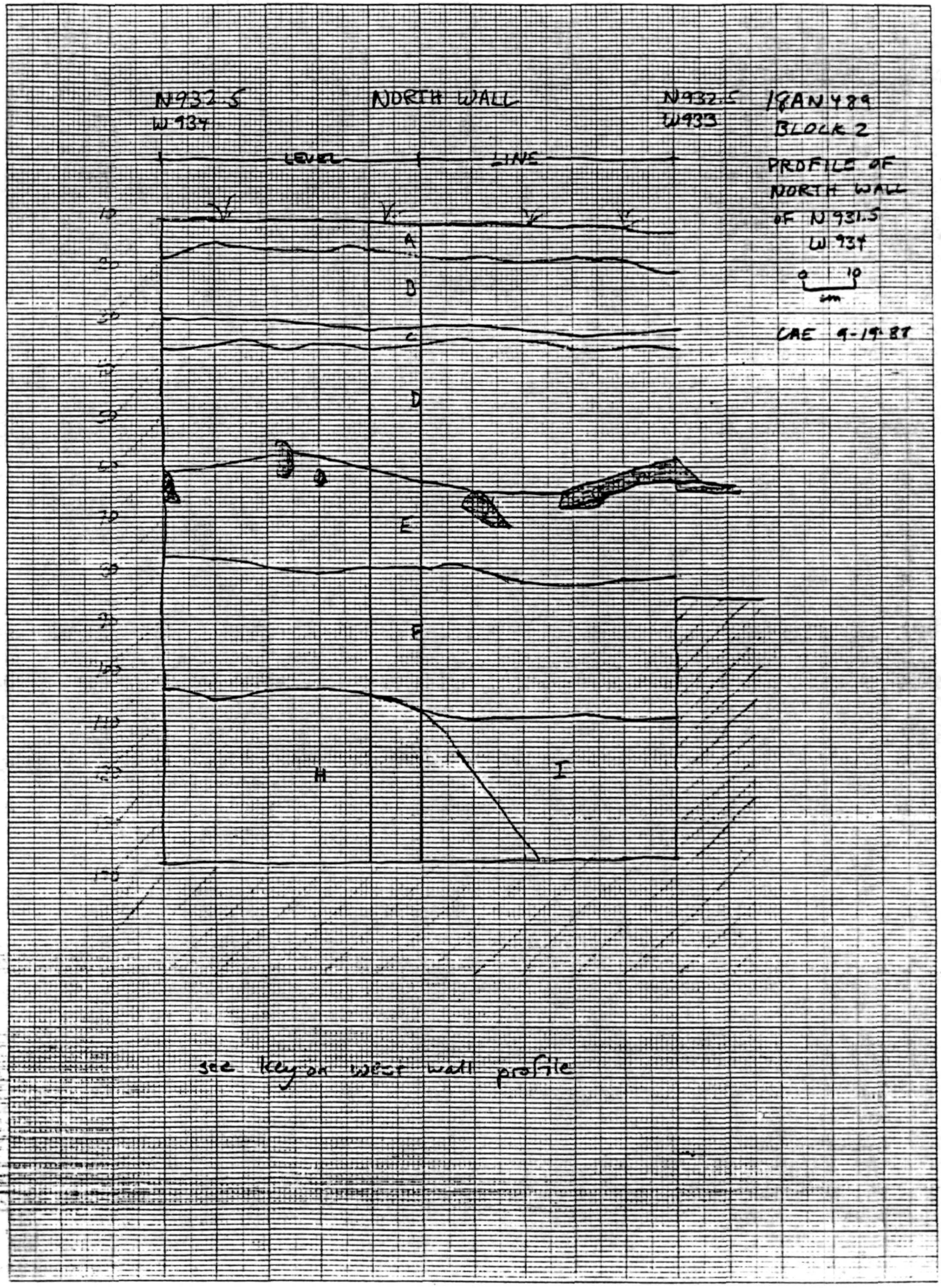
Carol A. Ebright
Principal Investigator



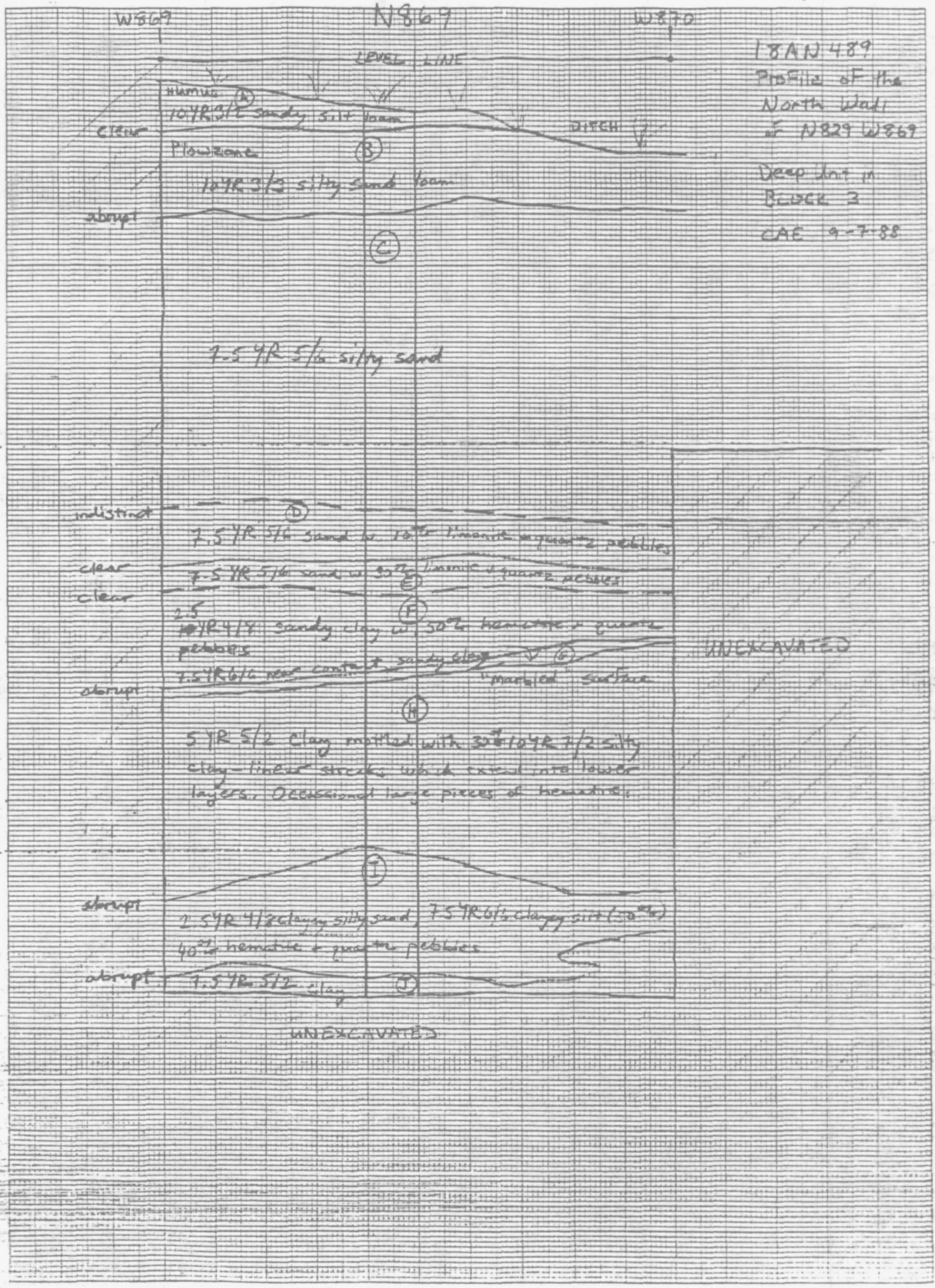
KEY (clean fill wall profile

limonite stains

A Humus 10YR2/1 sandy silt loam, clear boundary
B Plowzone 10YR3/3 silty sand loam, abrupt boundary
C Remnant Plowzone 10YR4/4 silty sand loam, abrupt boundary
D Subsoil 7.5YR5/6 silty sand, indistinct boundary
E Subsoil 7.5YR5/6 silty sand, somewhat lighter, with 30-60% limonite (large stains)
F Subsoil 5YR5/3 slightly clayey silty sand with 10-40% small hematite frags. (abrupt boundary)
G Areas of concentrated hematite
H Subsoil 10R4/4 Extremely compact clayey silt with 45% hematite
I Subsoil Banded 5YR5/6 sandy silt (extremely compact
2.5YR5/6 sandy silt)



see key on west wall profile



I8AN489
Profile of the North Wall of N829 W869

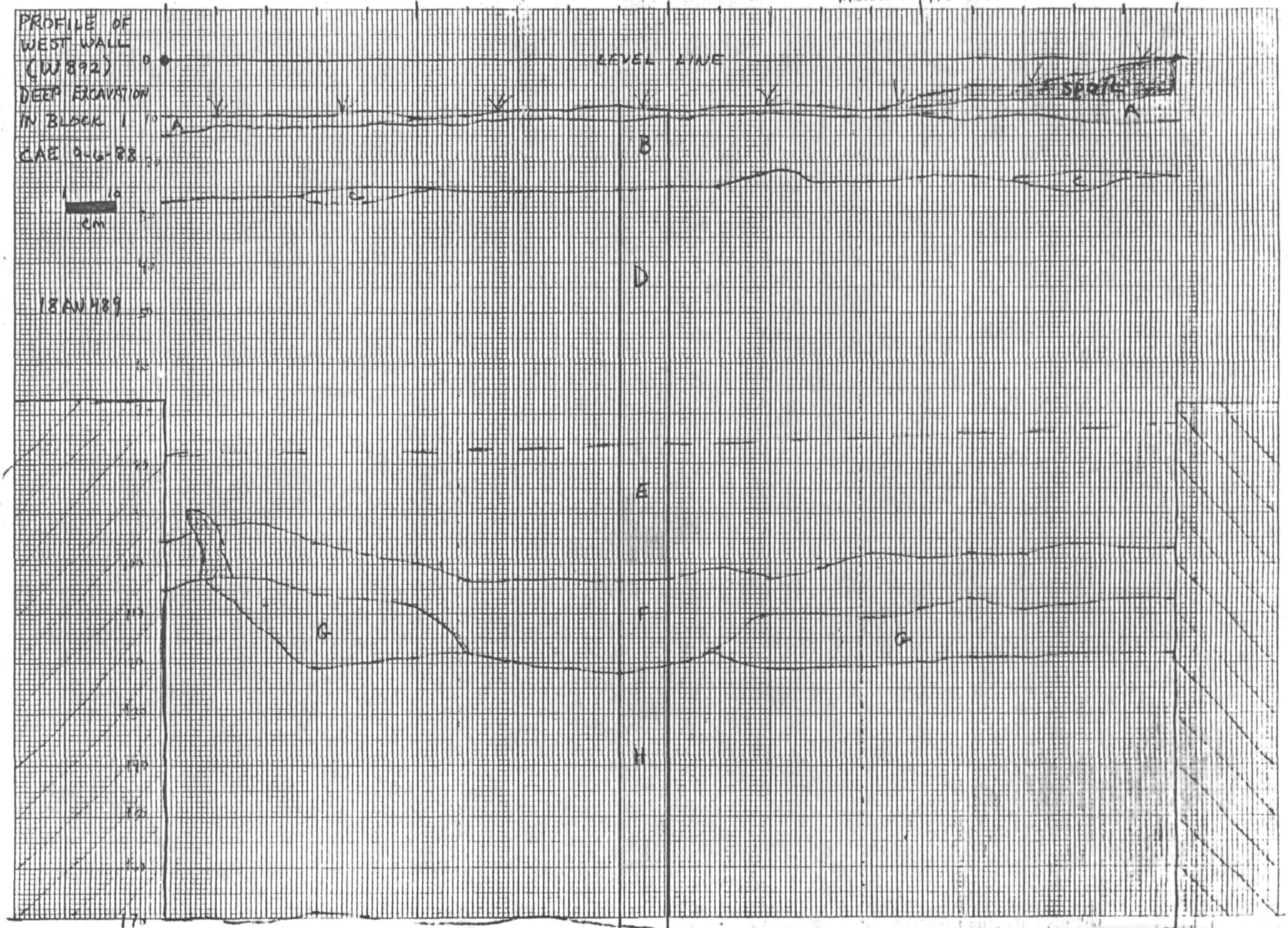
Deep dirt in Block 2

CAE 9-7-88

46 1512

E-U

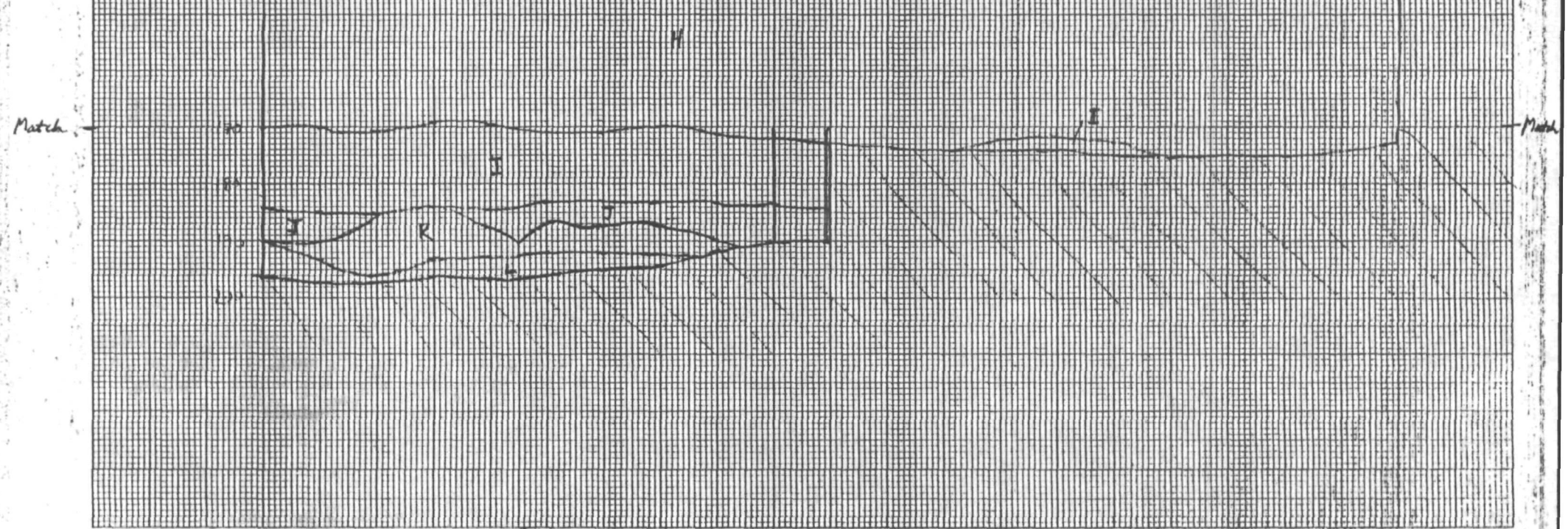
Page 1 of 2
Match on 170 line

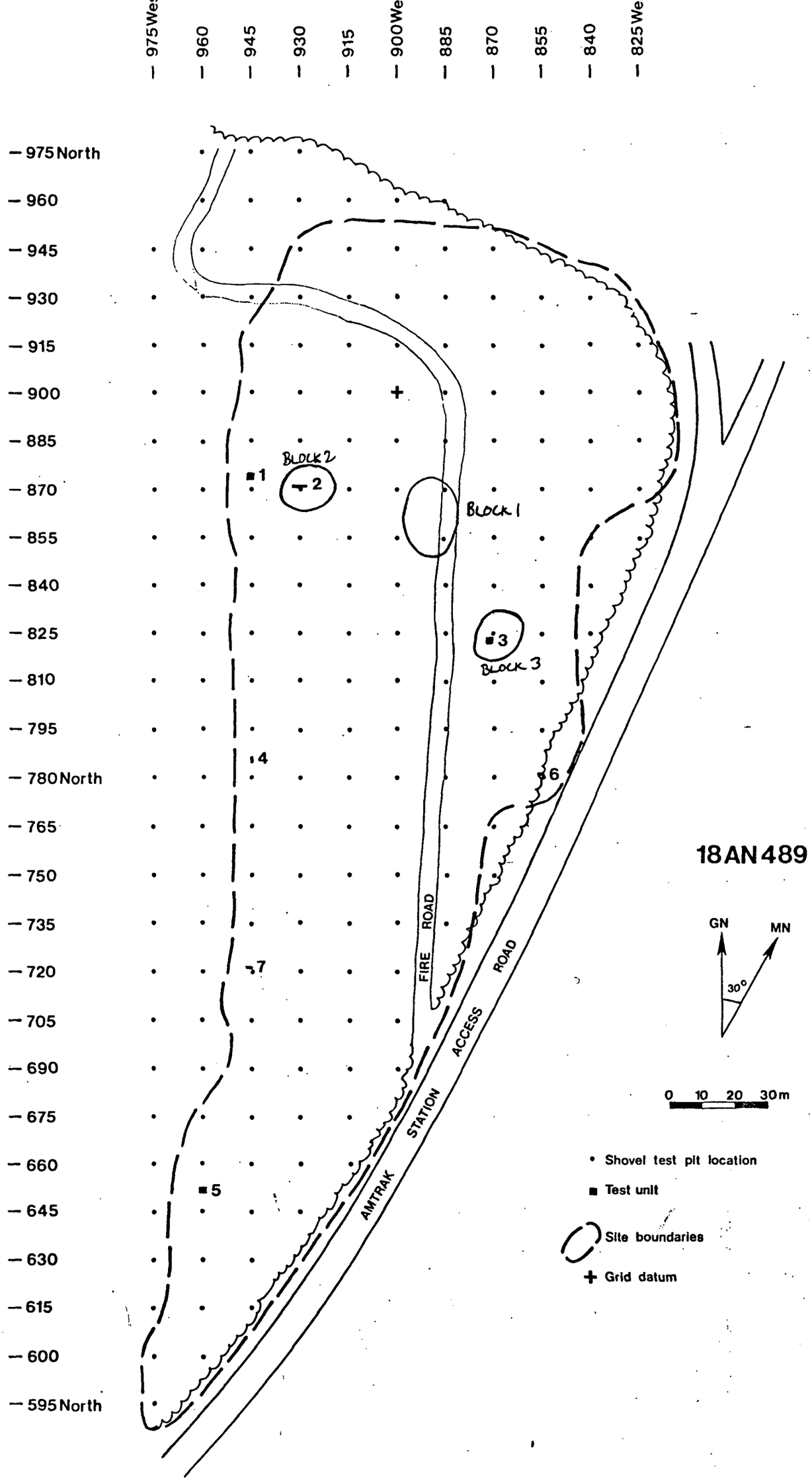


C51

A	Humus	10 YR 3/3	silt loam
B	Plowzone	10 YR 3/3	sandy silty loam
C	Remnant Pz ?	10 YR 4/4	sandy silty loam
D	Subsoil	7.5 YR 4/4	silty sand
E		7.5 YR 5/6	silty sand, more compact
F		40% 7.5 YR 7/6	Fine sand; 60% 7.5 YR 5/6 compact silty sand
G		7.5 YR 7/6	Friable fine sand
H		20% 7.5 YR 5/4	Coarse sand; 60% 7.5 YR 6/6 Fine sand; 20% 7.5 YR 7/6 fine sand
I		5 YR 5/2	compact silty sand
J		50% 7.5 YR 5/4	clayey sand; 50% 10 YR 7/4 sandy clay
K		2.5 YR 5/8	sandy clay
L		5 YR 5/4	clayey sand

boundary: clear, broken
boundary: abrupt, irregular
boundary: indistinct gradual transition
boundary: abrupt, irregular
trends to 60° layer
indistinct
boundary: abrupt, irregular
boundary: abrupt, irregular
boundary: abrupt, even, sloping




975 West
960
945
930
915
900 West
885
870
855
840
825 West
975 North
960
945
930
915
900
885
870
855
840
825
810
795
780 North
765
750
735
720
705
690
675
660
645
630
615
600
595 North
BLOCK 2
1
2
BLOCK 1
3
BLOCK 3
4
5
6
7
FIRE ROAD
AMTRAK STATION ACCESS ROAD
18AN489
GN
MN
30°
0 10 20 30m
Shovel test pit location
Test unit
Site boundaries
Grid datum

Carol

Maryland Department of Natural Resources

Maryland Geological Survey
2300 St. Paul Street
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Emery T. Cleaves
Deputy Director

Dr. Frank J. Vento
Dept. of Geography and Earth Science
Clarion State University
Clarion, PA 16214

13 April 1989

Dear Frank:

I did, indeed, receive the copy of your paper on genetic stratigraphy in the Susquehanna drainage later on the same day you called. I have since distributed copies to Dennis and Ira, who haven't had a chance to read it yet due to the SAA meetings and generalized office uncertainty. As you may have heard by now, the legislation for the Trust takeover of the Division of Archeology didn't make it through the legislature.

I read through my copy of the paper and thought it was very good. I would like to see a copy of the bibliography sometime. The only substantive comment that I have concerns the section on **Recognition of Genetic Surfaces**. Assuming that transgressive surfaces, climate-change surfaces, and genetic surfaces are parallel concepts, I think the term "genetic" is too broad. Or do you mean that transgressive surfaces and climate-change surfaces are kinds of genetic surfaces? I got confused in this section. I also couldn't find definitions of hardgrounds and firmgrounds in any of my geology books.

I have enclosed a copy of my MAAC paper and Deborah Seward's draft on the pollen results. She is still preparing material on the results of individual artifact pollen, phytolith, and other residue analyses. I decided to wait on doing extensive blood residue analyses on artifacts. The guys at Pitt don't really have their analytical act together yet, so I going to curate most of the tools dirty. I've sent a sample of 20 artifacts, rocks, and soil samples to Custer to get simple positive/negative results, and to see if he can pick up anything about the site that would yield false positive data.

Ira has promised to contact you about the Fourier (is this spelled right?) analysis this week and I will continue to

remind him. If you have any slides or prints of your SEM analyses that you can send, I'd like to see them.

Sincerely,

Carol A. Ebright

Carol A. Ebright
Principal Investigator

CAE:ejs

Enclosure

Maryland Department of Natural Resources

Maryland Geological Survey
2300 St. Paul Street
Baltimore, Maryland 21218
Telephone: (301) 554-5500

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Emery T. Cleaves
Deputy Director

Division of Archeology
(301) 554-5530

21 December 1988

Dr. Frank J. Vento
Dept. of Geography and Earth Science
Clarion State University
Clarion, PA 16214

Dear Frank:

Enclosed are four color slides of the deep unit profiles in Blocks 1, 2, and 3 on the Higgins Site. I hope these will help clarify the horizons shown on the black/white prints, and that you will be able to see the laminations at the base of the north wall in Block 2. I don't have any close-up shots of the laminations. By the way, the superimposed plowzones are clearly visible in the Block 2 profiles as well. This apparent substantial buildup of soil in historic times seems significant to me, and I have a hard time believing Wagner's "field edge" hypothesis given its widespread distribution. I need the slides back when you're done with them.

I have also ordered black/white prints of the gully uncovered in the northern portion of Block 1 near the Paleoindian component, and of the "stratigraphy" in the N866 trench under the fire road. I believe the latter is relatively recent precipitation of iron, perhaps facilitated by the compaction of soil from road use. It was clearly confined to the area under the road and did not extend beyond the road edges. This "stratigraphy", however, did not appear in the N855 trench which also cut through the road. I will mail these photos under separate cover as soon as they come back from processing.

Thanks for the data you sent on grain size. Hope you have a good holiday!!!

Sincerely,

Carol A. Ebright

Carol A. Ebright
Principal Investigator

CAE:ejs

Enclosure

Maryland Department of Natural Resources

Maryland Geological Survey
2300 St. Paul Street
Baltimore, Maryland 21218
Telephone: (301) 554-5500

William Donald Schaefer
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Kenneth N. Weaver
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Emery T. Cleaves
Deputy Director

Division of Archeology
(301) 554-5530

10 January 1989

Dr. Frank J. Vento
Dept. of Geography and Earth Science
Clarion State University
Clarion, PA 16214

Dear Frank:

Enclosed is a copy of a paper that Dennis Curry and I presented at the Archeological Congress in Baltimore earlier this week. I hope I stated your position accurately. I am also enclosing a copy of a paper by Dennis from 1980 which has been widely cited, and is the basis for much of the "aeolian debate". I have been unable to find any hard data from Foss in our project files for the Harmans and Baldwin sites. It is possible that Foss has it in his files, or, in the case of the Harmans site, that Kinsey has it. Foss definitely took soil samples at Baldwin.

As I mentioned on the phone, the person to talk to about sea level changes at the Maryland Geological Survey is Randy Kehrin. His phone number is (301)554-5544.

Our artifact processing and other analyses are proceeding well. We hope to start cataloguing this week. Hope you had a good holiday.

Sincerely,

Carol A. Ebright

Carol A. Ebright
Principal Investigator
Higgins Site

CAE:ejs

Enclosure

Maryland Department of Natural Resources

Maryland Geological Survey
2300 St. Paul Street
Baltimore, Maryland 21218
Telephone: (301) 554-5538

William Donald Schaefer
Governor

Torrey C. Brown, M.D.
Secretary

Kenneth N. Weaver
Director

Emery T. Cleaves
Deputy Director

18 Oct. 1988

Dr. Frank Vento
Dept. of Geography and Earth Science
Clarion State University
Clarion, PA 16214

Dear Frank,

Enclosed please find four black and white prints of the deep excavation units in Blocks 1, 2, and 3 on the Higgins Site. The photograph of the deep unit in Block 1 is somewhat dark, especially near the bottom of the pit; however, this dark area also reflects the onset of the reddish soil, and is not entirely the result of shadow.

We have found no more demonstrable Paleoindian remains since the second fluted point fragment, even though we expanded the excavations quite a bit. A clear quartz point fragment turned up in level 7 in a nearby unit, but it is so small that it is risky to even speculate about its type. Hopefully we will uncover more before our new end-of-fieldwork date in late October or early November.

I hope the soil analyses are going well. We are anxious to hear whatever results you are able to come up with.

Sincerely,

Carol A. Ebright
Principal Investigator

C1C16

Carol

PO-4

DNR REQUEST FOR SERVICE, MAINTENANCE OR CONSTRUCTION

- ☐ Request for Services $200.01 - $999.99
- ☒ Request for Services $1,000 - $7,500
- ☐ Request for Maintenance less than $7,500
- ☐ Request for Construction less than $7,500

AGENCY CONTROL NUMBER

Requesting Unit Name	Appropriation Code	Fund	Date
Maryland Geological Survey	30.01.11.007.002	01.11 (Genl.)	13 April 89

Description and Justification of Service:

Stephen Kennedy will analyze 10 samples (or more) from a stratigraphic column from the Higgins archeological site. He will study the shape of sand grains to determine how they were transported to the site and consequently explain how the artifacts from the site came to be buried and how they are to be interpreted. A report of results will be provided. Shape analysis complements particle size and mineral analyses to provide a clear interpretation of the site geomorphology. Because this site is so important in the interpretation of a little known culture (Paleoindians), it is important to completely understand the ~~[illegible]~~ accuracy of the archeological information we have from the site.

Total Contract Cost	Term of Contract	Contract I.D.#	Procurement Method
$1400.00	10 April 89 – 30 June 89		Sole Source

Vendor Name and Address Selected:

Stephen Kennedy
321 OEH
Dept of Geology & Planetary Science
University of Pittsburgh
Pittsburgh, PA 15260

Is selected vendor a State or Self-Certified Minority firm? No

How many Minority Firms were solicited? None

If there were '0' Minority Firms solicited, state reason why: None available.

☐ Sub contract ☒ Prime

I certify that sufficient funds are available and ✓ have, ____ have not been provided in the budget for the services requested. If funds have not been specifically provided in the budget for the requested services, funds will be available from the following source:

Justification or additional comments regarding procurement method:

Procedure is relatively new. No other institutions are known that provide this service commercially.

Attachments, if appropriate:

- ☐ Oral Solicitation form (P.O.2)
- ☐ Copy of written or published solicitation.
- ☐ Copy of bid board or newspaper notice.

Unit approval: _____ Date _____

Procurement Office Approval _____ Date _____

_____ Date _____

DEPARTMENT OF NATURAL RESOURCES

SOLE SOURCE/NO SUBSTITUTE PROCUREMENT DETERMINATION

DATE: 13 April 1989

ITEM(S): Fourier Shape Analysis of sand grains from Higgins Archeological Site (18AN479)

VENDOR: Stephen Kennedy
Dept. Geology & Planetary Science
NAME
321 OEH
University of Pittsburgh
STREET/P.O.BOX
Pittsburgh, PA 15260

REQUESTING: ___ NO SUBSTITUTE (omit #4 & #5) X SOLE SOURCE

JUSTIFICATION: Analysis of the shape of sand grains from a stratigraphic column at the Higgins site provides evidence on the origins of sediment transport, which is used in conjunction with size analysis and mineral analysis to determine how the archeological materials at the site came to be buried under the surface and how we should interpret the patterning of these artifacts.

PLEASE COMPLETE THE FOLLOWING:

1. Explain why no other product shall be suitable or acceptable to meet the need:
   Shape analysis of sand grains complements particle size and mineral analyses. All three are necessary to provide and understandable picture of events.

2. Explain what the results would be if the product is not obtained or becomes unavailable:
   The reconstruction of events on the Higgins site would be called into question. Given the supreme importance of the archeological deposits there, our results will be widely disseminated and discussed. We need to be as certain as possible in our interpretations.

3. Are sufficient funds available? Yes ✓ No ___

4. Is the price fair and reasonable? Yes ✓ No ___

3

5. What is the relationship of the State's price to the published list price? Are we getting a good discount?

NA

6. Is there another product which is comparable but cost more or less?

NA

7. If purchased previously, how does the current price compare with the previous price?

NA

Signature: _____
Originator

It is determined this procurement is in compliance with COMAR 21.

Approval Granted: _____
Associate Procurement Officer

Approval Granted: _____
Agency Head Designee

PO-10
12/86

Maryland Geologic Survey FAX 301-554-5502
2300 St. Paul Street
Baltimiore, MD 21218

ATTN: Ira Beckerman

The shape of sedimentary particles contains information concerning the source rock and the subsequent processes involved in transport and deposition. Although there is no universal relation between these factors and shape, the analysis of particle shape sheds light on the history of such particles. In a situation where particles share a similar history, but the particles in one deposit underwent an additional cycle, this last cycle may well leave its imprint in the form of modified shape that is detectable using sophisticated shape analytic techniques. In the present set of samples, I propose to analyze sedimentary particles in a stratigraphic sequence to determine the nature of trends, if any, in the shape of quartz particles which might be related to differences in transport history.

The shape of sedimentary particles is, to some extent, a function of size and composition. These factors are kept constant so that the results are not confounded. Samples are sieved and a small size range, where sediment is abundant in all samples, is selected for analysis. Only the quartz in these size splits are to be analyzed. The samples are treated with HCl to remove carbonates, and with a short HF bath to etch the feldspars so that they are visually recognizable under the microscope. These samples are mounted on a glass slide and placed under a microscope with a TV and computer attachment to acquire a minimum of 200 particle periphery points for Fourier analysis of 300 grains in each sample. The Fourier analysis results in 24 shape descriptors for each grain, and a frequency distribution of each of these descriptors for each sample. The shape frequency distributions are analyzed to determine the shape relations among all samples.

Dr. Stephen K. Kennedy will provide a report including the raw shape information for all samples, a discussion of what the shape trends are, and an interpretation with respect to the sedimentologic interpretation.

from STEPHEN KENNEDY
321 OEH
Dept. of Geology & Planetary Sc.
University of Pittsburgh.
Pittsburgh, PA 15260

Dear Carol:

Please find enclosed some granulometric (grain size) completed data sheets for the Higgins Site. I used whole phi intervals to do the preliminary grain size analyses, however, it nicely shows the grain size distributions. Note that in most samples there is a modest percentage of grains in the 2 mm, 1 mm and .5 mm size classes. Clearly, these distributions indicate a non-aeolian sediment source. Also note that in the samples currently processed that there is a distinctive fining upward sequence in the sediment profiles. This fining upward sequence is characteristic of alluvial sequences.

Carol please send any information you can gather on the general geology of the immediate study area, as well as any information on high sea level stands which would have inundated this area since Cretaceous times. Although I believe that the last cycle of transport was fluvial the grains appear to represent reworked sediments from an earlier (Cretaceous/Tertiary) beach/dune complex (during a high sea-level stand).

Sincerely,

Frank J. Vento.

Frank J. Vento

Project file Higgins Phase III

TELEPHONE MEMORANDUM

MGS Staff member Bright

Person contacted Vento

Telephone number

Project name

Site number (if applicable)

Date 11-17-88 Time

Notes:

Vento called to report preliminary results of soil analyses. SEM showed grains were frosted, + sub-to well-rounded. He believes frosting is Cretaceous derived. Grains are mostly quartz but he also has heavy minerals, esp. fairly large (1/4 mm) tourmaline crystals w. intact faces. He believes these are locally derived — good condition indicates limited transport distance. Deposits on site are fluvial in origin based on grain size + presence of heavy minerals. Kettle Branch is source. No material source

~~Action needed~~: for mass wasting. He still believes the limonite in Block 2 is/are manganese.

Other staff to be alerted:

DNR-MGS-45

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN489

Information on bag

Initial weight of sample used in sieving (range 50-55 gm) 50 g

Sieved fraction weights (1/100 gm)

4mm	0 g	.25mm	23.66 g
2mm	.38 g	.125mm	10.6
1mm	.9 g	.063mm	4.2 g
.5mm	7.4 g	.063mm	2.86 g

Sum of weights (1/100 gm) of sieved fractions 50 g

Comments IV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/85

Sample number 18AN484

Information on bag

Block 1
H-6

Initial weight of sample used in sieving (range 50-55 gm) 50.0 g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.89 g
2mm	0g	.125mm	13.88 g
1mm	0g	.063mm	3.70 g
.5mm	7.32 g	.063mm	0.21 g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/19/88

Sample number 18AN45

Information on bag

18AN 45g

BRICK 1

1-1

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0.82g	.25mm	17.87g
2mm	.02g	.125mm	9.0mm
1mm	.03g	.063mm	4.5g
.5mm	3.68g	.063mm	13.97g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 18AN489

Information on bag

Block 1

11-9

Initial weight of sample used in sieving (range 50-55 gm) 500g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	17.69g
2mm	0g	.125mm	8.0g
1mm	1.79g	.063mm	1.01g
.5mm	15.06g	.063mm	6.25g

Sum of weights (1/100 gm) of sieved fractions 500g

Comments J.V.

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 19AN485

Information on bag

[illegible] Block 1

[illegible] H-3

Initial weight of sample used in sieving (range 50-55 gm) ~50.0g

Sieved fraction weights (1/100 gm)

~~4mm~~		.25mm	27.75g
~~2mm~~		.125mm	12.79g
1mm	1605g	.063mm	2.51g
.5mm	5.23g	.063mm	

Sum of weights (1/100 gm) of sieved fractions ~50.0g

Comments Denny | Jarvis

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 18AN498

Information on bag

Block 3

D-1

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	1.99g	.25mm	21.08g
2mm	0.73g	.125mm	8.7g
1mm	0.72g	.063mm	4.29
.5mm	7.94	.063mm	4.64g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments IV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 18HN489

Information on bag

Block 3

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	15.0g	.25mm	8.79g.
2mm	1.09g	.125mm	5.76g.
1mm	0.9g	.063mm	3.2g
.5mm	3.84g	.063mm	11.42g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV.

WET SIEVE DATA SHEET

F. J. Vento

Date 11/29/88

Sample number SAN484

Information on bag

Beck 3

D-2

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	20.54g	.25mm	10.48g
2mm	1.1g	.125mm	5.8g
1mm	0.6g	.063mm	2.81g
.5mm	3.58g	.063mm	5.09g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/29/88

Sample number 18AN487

Information on bag

Block 3

H-16

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0.6g	.25mm	16.08g
2mm	1.11g	.125mm	15.31g
1mm	1.4g	.063mm	10.26g
.5mm	5.27g	.063mm	1.66g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN45

Information on bag

Block 1

T-2

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.68g
2mm	0.11g	.125mm	10.52g
1mm	1.41g	.063mm	2.53g
.5mm	9.17g	.063mm	1.58g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments NV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number ISAIV48'9

Information on bag

BLOCK 1

E-4

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0.29g	.25mm	24.65g
2mm	0.33g	.125mm	7.71g
1mm	1.13g	.063mm	5.17g
.5mm	9.34g	.063mm	

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments)\/

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 18AN485

Information on bag

Block H - [illegible]

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0 g	.25mm	27.82g
2mm	0 g	.125mm	8.68g
1mm	0.38g	.063mm	2.21g
.5mm	9.04g	.063mm	1.87g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/21/88

Sample number 18AN489

Information on bag

Block 1

#=10

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	22.86g
2mm	0g	.125mm	9.53
1mm	1.34g	.063mm	2.39g
.5mm	11.83g	.063mm	1.75g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JY

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 1SAN45

Information on bag

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	23.79g
2mm	0.3g	.125mm	9.63g
1mm	1.24g	.063mm	3.04g
.5mm	4.8g	.063mm	3.18g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments IV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN45

Information on bag

Block 1

F3

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.80g
2mm	0.21g	.125mm	9.95g
1mm	1g	.063mm	2.33g
.5mm	9.72g	.063mm	1.99g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments IV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN48

Information on bag

Block 1

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.58g
2mm	0.5g	.125mm	10.14g
1mm	1.1g	.063mm	3.42g
.5mm	7.95g	.063mm	2.31g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments IV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/85

Sample number 18AN48

Information on bag

Bicarb

11-2

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	27.61
2mm	0g	.125mm	11.41.
1mm	0.44g	.063mm	4.47g
.5mm	5.24g	.063mm	0.79g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN48?

Information on bag

BrCl

11-1

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	26.97
2mm	0g	.125mm	11.34g
1mm	0.34g	.063mm	2.77g
.5mm	6.74g	.063mm	1.84g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN48C1

Information on bag

BULK

-4

CH

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	21.52g
2mm	0g	.125mm	11.81g
1mm	1.27g	.063mm	4.08g
.5mm	10.43g	.063mm	0.89g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments IN

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 1SAN489

Information on bag

15 C.C.K 1

T-1

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.70g
2mm	0g	.125mm	11.33g
1mm	0.73g	.063mm	2.98g
.5mm	6.72g	.063mm	3.54g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/85

Sample number 18TN 439

Information on bag

Block 4 4

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0 g	.25mm	24.95g
2mm	0 g	.125mm	10.97 gm.
1mm	0.22 g	.063mm	2.5g
.5mm	5.53g	.063mm	1.83g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments J.V.

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number 18AN489

Information on bag

Block 1

H-5

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	28.01
2mm	0g	.125mm	8.11g
1mm	~~0.00~~ 0.75g	.063mm	1.39g
.5mm	9.72g	.063mm	26.75g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments TV

WET SIEVE DATA SHEET

F. J. Vento

Date 11/18/88

Sample number SAN4X

Information on bag

Point 1

I-2

Initial weight of sample used in sieving (range 50-55 gm) 50.0g

Sieved fraction weights (1/100 gm)

4mm	0g	.25mm	24.1g
2mm	0g	.125mm	10.31g
1mm	0.34g	.063mm	1.69g
.5mm	6.0g	.063mm	7.56g

Sum of weights (1/100 gm) of sieved fractions 50.0g

Comments JV

BLOCK ONE
Horizon A- sample levels a,b,c.
DEPTH: 0-40 cm.
AVE. MEAN PHI VALUE: 2.39
AVE. STD. DEV.: 2.60
AVE. SKEWNESS: 0.07
AVE. KURTOSIS: 0.14

Horizon B- sample levels d,e,f,g,h,i,j.
DEPTH: 50-360 cm.
AVE. MEAN PHI VALUE: 2.44
AVE. STD. DEV.: 2.39
AVE. SKEWNESS: 0.03
AVE KURTOSIS: 0.15

BLOCK TWO
Horizon A- sample level a.
DEPTH: 10 cm.
MEAN PHI VALUE: 2.29
STD.DEV.: 3.42
SKEWNESS: 0.01
KURTOSIS: 0.09

Horizon B- sample levels b,c,d,e.
DEPTH: 20-150 cm.
AVE. MEAN PHI VALUE: 2.43
AVE. STD. DEV.: 3.13
AVE. SKEWNESS: 0.03
AVE. KURTOSIS: 0.09

Horizon C- sample level f,i.
DEPTH: 160-200 cm.
AVE. MEAN PHI VALUE: 2.37
AVE. STD. DEV.: 4.13
AVE. SKEWNESS: -0.001
AVE. KURTOSIS: 0.075

Patapsco Fm.- sample level h.
DEPTH: 210-230 cm.
AVE. MEAN PHI VALUE: 4.29
AVE. STD. DEV.: 1.96
AVE. SKEWNESS: -.242
AVE. KURTOSIS: 0.502

Carol,
Here is a table showing statistical results of grain size analysis. (I did not include histograms). Note the general fining-upward trend typical of fluvial deposits. Also note the relatively coarse-grained nature of the site's sediments.

P.S.
4mm = -2 phi
2mm = -1 phi
1mm = 0 phi
.5 = 1 phi
.25 = 2 phi ← site's sediments
.125 = 3 phi
.063 = 4 phi ← Patapsco locally
<.063 = <4 phi

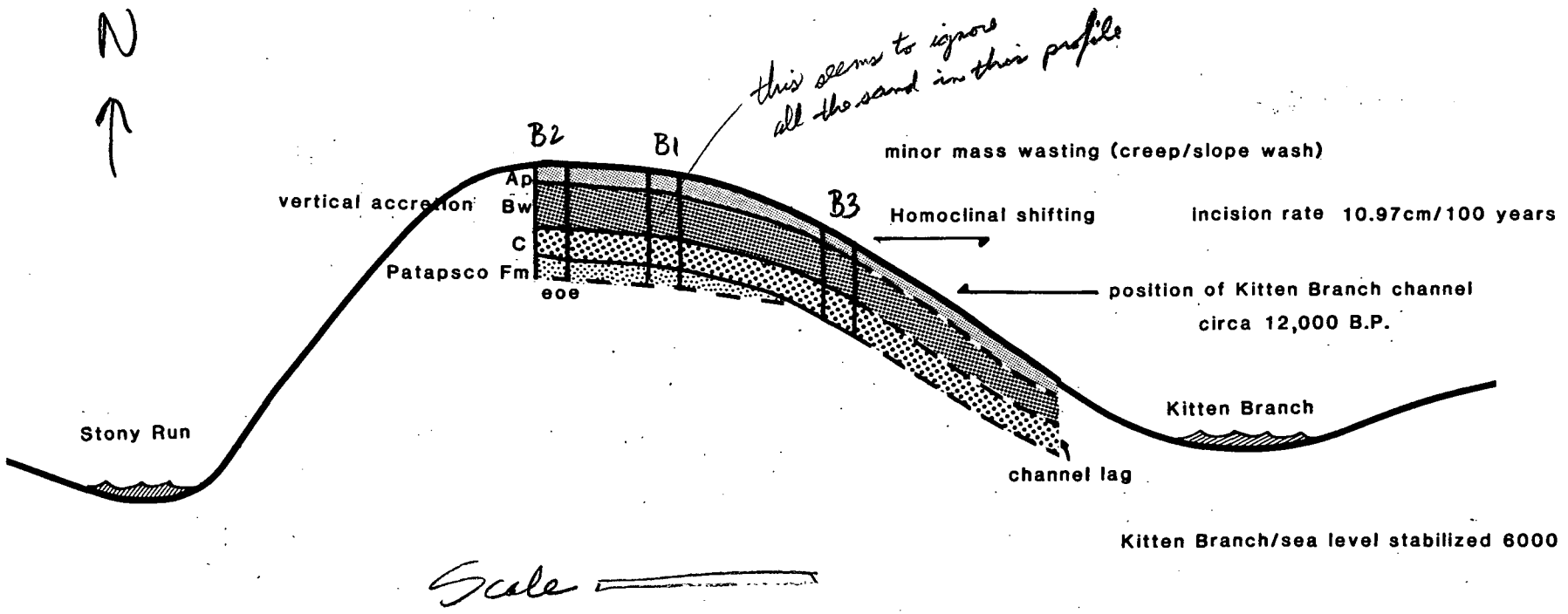
BLOCK THREE
Horizon A- sample levels a,b.
DEPTH: 10-40 cm.
AVE. MEAN PHI VALUE: 2.43
AVE. STD. DEV.: 2.41
AVE. SKEWNESS: 0.06
AVE. KURTOSIS: 0.14

Horizon B- sample level c.
DEPTH: 50-150 cm.
AVE. MEAN PHI VALUE: 2.62
AVE. STD. DEV.: 2.67
AVE. SKEWNESS: 0.06
AVE. KURTOSIS: 0.12

Horizon C- sample levels d,e,f,g.
DEPTH:160-220 cm.
AVE. MEAN PHI VALUE: 2.04
AVE. STD. DEV.: 5.06
AVE. SKEWNESS: -0.04
AVE. KURTOSIS: 0.09

Patapsco Fm.- samples h,i.
DEPTH: 230-320
AVE. MEAN PHI VALUE: 3.75
AVE. STD. DEV.: 3.36
AVE. SKEWNESS: -0.15
AVE. KURTOSIS: 0.23

GEOLOGIC CROSS SECTION
at the
HIGGINS SITE



Source: F. Vento

ECS